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ABSTRACT

Three aspects of sex differences in reading achievement were investigated, based on data from school records and test results for first through fourth grade students in two parochial schools. The three aspects that were studied included (1) the relationship between sex-typed perceptions of reading and reading achievement, (2) changes in students' sex-typed perceptions of reading between grades one and four, and (3) those variables that discriminate between sex-appropriate and sex-inappropriate perceptions of reading. The results, inconsistent with those of past studies, suggested the possibility of the development of a new trend away from sex differences in reading achievement and from the sex-typing of reading as a feminine activity. In addition, the study showed that when reading was regarded as a sex-appropriate activity by members of both sexes, there were no significant sex differences in reading achievement. (RL)

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A CURRENT INVESTIGATION OF SEX DIFFERENCES IN READING ACHIEVEMENT AND THE SEX-TYPING OF READING

by

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Statement of the Problem

The problem was concerned with three aspects related to sex differences in reading achievement. One aspect examined was the relationship between sex-typed perceptions of reading and reading achievement. The study was designed to reveal the amount of unique variance of reading achievement scores attributable to the effects of sex-typed perceptions of reading independent of other variables including IQ, grade level, age, sex, reading attitude, and socio-economic level.

A second aspect investigated in the study was the relationship between grade level and sex-typed perceptions of reading to determine if and when male students' sex-appropriate perceptions of reading changed to sex-inappropriate. The results of studies by Downing and Thomson (1977) and Downing, Dwyer, Feitelson, Jansen, Kemppainen, Matihaldi, Reggi, Sakamoto, Taylor, Thackray, and Thomson (1979) revealed that the majority of first grade boys and girls had sex-appropriate perceptions of reading. In the other sample groups, from fourth grade through adults, the majority of girls still had sex-appropriate perceptions while the boys had sex-inappropriate perceptions of reading classifying reading as feminine.

The third aspect examined the relationship between sex-typed perceptions of reading and the independent variables of reading achievement, IQ, age, grade level, reading attitude, and socio-economic level. The purpose of the examination was to determine which of the independent variables were the best discriminators of sex-appropriate and sex-inappropriate perceptions of reading.

Purpose of the Study

It was believed that should the results of the study confirm the results of previous research conducted by Dwyer (1972), Downing and Thomson (1977), and Downing et al (1979), the findings would indicate a need for educators to more seriously consider the effects of sex-typed perceptions of reading upon reading achievement. Knowledge of the results could be used by classroom teachers and reading specialists in developing teaching methods and materials aimed at eliminating sex differences in reading achievement.

Results pertaining to the relationship of sex-typed perceptions of reading and grade level and the existence of a perception-changing trend between grades one and four could be used by teachers to develop and implement a preventative or intervention program emphasizing the sex-appropriateness of reading for all students at all four grade levels. Teachers would no longer need to rely solely upon a remedial approach to some reading disabilities.

The results of examining the relationship between sex-typed perceptions of reading and the variables reading achievement, IQ, grade level, age, reading attitude, and socio-economic level would provide a better understanding of sex-typed perceptions of reading

and knowledge of which variables were strong discriminators of sex-appropriate and sex-inappropriate perceptions of reading. This information would be valuable for educators in working with and understanding sex differences in reading achievement.

Definition of Key Terms

The following list was compiled from the original list of definitions for the study. The definitions were derived from Burns' and Roe's Teaching Reading in Today's Elementary School, Gross's article "Sex-role Standards and Reading Achievement: A Study of an Israeli Kibbutz System" (The Reading Teacher, vol. 32, pp. 149-156), and the researchers' own explanations.

Neutral Perception of Reading. Neutral perception of reading is a conception of reading where reading is regarded as appropriate for members of both sexes as measured by the Downing Object-Activity Opinion Survey.

Reading Achievement. Reading achievement is the extent to which the student has acquired or mastered the skills needed for decoding written symbols and deriving meaning from the symbols as measured by a test instrument (Burns & Roe, p. 457). For the purpose of this study the standard score from the reading comprehension section of the Iowa Tests of Basic Skills, as made available by the two parochial schools, was used to measure reading achievement.

Sex-appropriate. Sex appropriate is that which is regarded by the learner as proper and correct for the members of his or her sex.

Sex-inappropriate. Sex-inappropriate is that which is regarded by the learner as improper or incorrect for the members of

his or her own sex.

Sex-role Expectations. Sex-role expectations are those behaviors and characteristics that a society expects the members of each sex to exhibit.

Sex-role Standards. Sex-role standards are an individual's conception of the behavior and attributes which are appropriate to each sex (Gross, p. 150).

Sex-typed Perception of Reading. Sex-typed perception of reading is a conception of reading based upon and affected by an individual's sex-role standards where reading is regarded as appropriate for members of one sex and inappropriate for members of the other sex. For the purpose of this study, the Downing Object-Activity Opinion Survey was used to measure sex-typed perception of reading.

Theoretical Framework

In the past 50 years evidence has been obtained from research supporting the claim of sex differences in reading achievement in American elementary school students. Gates' study (1961) of 13,000 elementary school students revealed that female students significantly outscored male students on reading comprehension and vocabulary tests. Succeeding studies by Preston (1962), Bond and Dykstra (1967), Johnson (1973), and Herman (1975) confirmed Gates' results. In addition, remedial reading classes from 1932 through the present have contained more males than females in ratios varying from 2:1 to 4:1 for mild cases and 10:1 for severe cases (St. John, 1932; Durrell, 1940; Mumpower, 1970; Bannatyne, 1971; Naiden, 1976).

Various theories have been developed to explain sex differences in reading. The theories fall into two broad categories: (a) physiological-biological-maturational factors and (b) societal-cultural-educational factors (Johnson, 1973). Proponents of the first category (Lincoln, 1927; Pauley, 1951; Smith & Carrigan, 1959; Bentzen, 1966) have basically concluded that sex differences are inherent due to biological factors including differences in maturation rates of males and females.

Proponents of the second category have claimed that societal and cultural sex-role expectations and/or a feminized educational environment are responsible for sex differences in reading. As far back as 1909 Leonard Ayres theorized that the higher rate of retardation (working below grade level), elimination by grade eight (dropping out of school), and grade repetition among male students was in part due to the feminized school which better met the needs of girls. Other supporters in this category include St. John (1932), McNeil (1964), Mazurkiewicz (1960), Gates (1961), Preston (1962), Dwyer (1974), and Downing and Thomson (1977).

Recent research has been aimed at resolving the conflict in theories. Cross-cultural studies (Preston, 1962; Johnson, 1973; Downing, 1973; Gross, 1978] were conducted to determine the existence of sex differences in reading in other countries. Differences, if attributable to biological factors, would be present in other cultures; the superiority of young female students in reading would not be unique only to the United States. The results of the research showed that in some countries (Israel, Japan) there were no

differences in reading achievement; in other countries (England, Nigeria, India, Germany) boys outachieved girls, while in still others (France, Canada, United States) girls outachieved boys. These findings added support for the societal-cultural theories.

Educators in favor of the societal-cultural theories believe that in the United States young boys perceive reading as a feminine activity inappropriate for their sex. Therefore, boys with a sex-inappropriate perception of reading avoid reading which causes poorer achievement. Montemayor's work (1974) emphasized that children strongly resisted association with objects or activities labeled as more appropriate for the opposite sex. Stein, Pohly, and Mueller (1971) found that boys showed the greatest amount of achievement-motivation and achievement-behavior on tasks labeled masculine and the least amount on tasks labeled feminine. Dwyer's study (1972) of the relationship between reading achievement, IQ, and sex-role standards (an individual's conceptions of the behaviors and attributes appropriate for each sex) revealed that the effects of IQ on reading achievement were approximately equal for both males and females. However, the effect of sex-role standards upon reading achievement was stronger for the boys. More unique variance in achievement scores was accounted for by the boys' sex-role standards than by the girls'.

Mazurkiewicz's study (1960) of reading attitude showed a positive relationship between father's and son's attitudes toward reading. The majority of father-son subjects labeled reading as "mostly feminine." Those boys who classified reading as a feminine activity had slightly lower reading achievement scores than the boys who classified reading as masculine.

In a study of high-interest versus low-interest reading materials (Asher & Markell, 1974) boys scored as well as girls on material which they had rated as highly interesting. On low-interest materials, boys scored below girls. The girls' scores were relatively unaffected by the interest level of the material. This study suggests three conclusions: (a) that boys have as much reading achievement potential as girls, (b) that reading can become an acceptable activity for boys when the content of the material is perceived as masculine, and (c) that girls tend to be more conformist than boys.

Research by Downing and Thomson (1977) added further support to the theory that reading is perceived as an inappropriate activity for boys. Their study of sex-role stereotypes of reading included six groups: first graders, fourth graders, eighth graders, 12th graders, teacher trainees, and randomly-selected adults. They found that the majority of subjects, both males and females, in all samples except the first grade sample, rated reading as an activity more appropriate for females.

A follow-up study by Downing et al (1979), conducted in seven countries, revealed that in Denmark and Japan reading is regarded by males at all age levels as a masculine activity. In the other countries reading was rated masculine by the youngest-age sample, but feminine by older-age samples. The findings for the six groups in the United States and Canadian samples replicated the findings of the earlier study. Again there was evidence of a change in boys' perception of reading as a masculine activity to a feminine activity between grades one and four. Neither of Downing's studies included a comparison of sex-typed perceptions of reading and reading

achievement.

Past research has provided support for the societal-cultural theories of sex differences in reading achievement. In addition, research has indicated that some of the difference may be due to students' sex-role standards or their perceptions of the appropriateness or inappropriateness of reading for their own sex. Downing's two studies revealed that North American first grade boys perceived reading as a sex-appropriate activity while fourth grade boys did not. These studies did not provide an answer as to when the perceptions changed. The present study attempted to discover when between grades one and four reading is no longer perceived by boys as a sex-appropriate activity. The study also attempted to determine which factors (reading achievement, IQ, age, grade level, reading attitude, socio-economic level) were the best discriminators of sex-appropriate and sex-inappropriate perceptions of reading.

Hypotheses

The following general hypotheses were developed from questions concerning sex differences in reading achievement, the relationship between sex-typed perceptions of reading and reading achievement, the relationship between grade level and sex-typed perceptions of reading, and the ability of certain independent variables to discriminate between sex-appropriate and sex-inappropriate perceptions of reading:

1. There is a significant difference between girls' and boys' reading achievement scores at each and over all four grade levels (grades one through four).

2. There is a significant relationship between students' sex-typed perceptions of reading and their reading achievement scores independent of each and all of the variables sex, IQ, grade level, age, reading attitude, and socio-economic level.

3. There is a significantly greater number of boys and girls at all grade levels who consider reading as a feminine activity than as a masculine activity.

4. There is a trend for students' sex-typed perceptions of reading to change between grades one and four.

5. There is a significant relationship between each of the independent variables grade level, reading achievement, IQ, age, reading attitude, and socio-economic level and the dependent variable sex-typed perceptions of reading.

Analyses of Data

To study the three aspects of sex differences in reading achievement, an ex post facto design employing specific research and alternative hypotheses was used. The data for the study were collected from school records and the results of tests administered to students in grades one through four in two parochial schools.

Two instruments were administered to all the students to measure their (a) sex-typed perceptions of reading and (b) reading attitude. The instruments used were (a) the Downing Object-Activity Opinion Survey and (b) the Estes Reading Attitude Scale. The standard scores from the Cognitive Abilities Test and the reading comprehension section of the Iowa Tests of Basic Skills, as made available through the schools, were used as measures of students' IQ and reading

achievement.

Multiple linear regression was used to analyze the relationship between independent and dependent variables for the first and second general hypotheses, to conduct trend analysis for the fourth general hypothesis, and to conduct discriminant analysis for the fifth general hypothesis. Chi-square analysis of observed to expected frequencies was used to test the third general hypothesis concerned with the classification of reading as a feminine activity.

For the discriminant analysis, tests of interaction between each of the independent variables (reading achievement, IQ, age, grade level, reading attitude, and socio-economic level) and sex were conducted first. With a lack of significant interaction, each independent variable was then tested as a significant discriminator between sex-appropriate and sex-inappropriate perceptions of reading. For each test the effects of sex were controlled.

One- and two-tailed tests of significance at the .05 alpha level were used for testing the hypotheses. The decision to use a one- or two-tailed test was based upon the results of past research.

Findings and Conclusions

The first general hypothesis was concerned with sex differences in reading achievement at each and over all four grade levels. The results showed no significant difference between the girls' and boys' reading achievement scores over the entire sample. The girls insignificantly outperformed the boys in only grades two and three. At grades one and four, the boys outscored the girls, but, again, at nonsignificant probability levels. From these findings, the researcher concluded that the lack of sex differences in reading achievement in this sample

was not typical of American achievement patterns found 10 to 20 years earlier, but could possibly be indicative of a new trend developing during the past five to 10 years. These results suggested that new research should be conducted with larger and more diverse student sample groups to determine the current achievement patterns for American girls and boys.

General hypothesis two examined the significance of the relationship between sex-typed perceptions of reading and reading achievement. The results showed that sex-typed perceptions of reading did not account for a significant amount of unique variance in predicting reading achievement. Though there was no indication of a significant relationship at the .05 alpha level, the researcher noted that the results were consistent with the findings of other studies (Dwyer, 1972; Gross, 1978). On the basis of past research, the lack of a statistical relationship could be interpreted as an indication of an actual relationship. The majority of both boys and girls had sex-appropriate perceptions of reading and reading achievement scores at or above grade level. Based on the findings of other studies, a higher frequency of sex-appropriate perceptions of reading would be expected when there are no sex differences in reading achievement and a lower frequency when there are sex differences. The researcher concluded that the findings were consistent for this study and with past research.

The third general hypothesis was concerned with the sex-typing of reading as a feminine activity. The results of the chi-square analyses revealed that reading was not sex-typed as a feminine activity. Instead, reading was perceived as appropriate for both sexes.

With the finding of no significant sex differences in reading achievement, it was logical and consistent to find no significant sex-typing of reading.

General hypothesis four investigated the possibility of a perception-changing trend between grades one and four. There was a slight movement from sex-appropriate to sex-inappropriate perceptions of reading for both sexes. However, neither was significant at the .05 alpha level. It was concluded that in this study there was no significant trend for either boys' or girls' perceptions of reading to change from sex-appropriate to sex-inappropriate between grades one and four. The findings and conclusion were noted as consistent with those for the preceding three hypotheses.

For the fifth hypothesis reading attitude with the effects of sex controlled was found to be a significant discriminator of reading perceptions. Positive correlations were noted between positive reading attitude and sex-appropriate perceptions and between negative reading attitude and sex-inappropriate perceptions. The researcher concluded that, for the subjects in this study, it would be possible to predict reading perception from knowledge of reading attitude and the reverse--predict reading attitude from knowledge of reading perception.

Implications

The present study, with a lack of significant findings, provided little conclusive information pertaining to sex differences in reading achievement. However, the findings were consistent with the results of a study by Gross (1978) of Israeli kibbutz children.

Gross's study and the present study suggested the possibility of a relationship between sex-typed perceptions of reading and reading achievement such that when reading is regarded as a sex-appropriate activity by members of both sexes, there are no significant sex differences in reading achievement.

The implication from the finding that reading attitude was a significant discriminator of reading perceptions was that knowledge of one of the factors (attitude or perception) would permit a teacher to predict the other factor. This finding could be of value to classroom teachers and reading specialists. If a teacher had access to one instrument, either the reading perception instrument or the attitude scale, he/she could, within a small margin of error, estimate the measurement for the other factor.

A major implication from this study is that there may be a trend away from sex differences in reading achievement and the sex-typing of reading as a feminine activity in the United States. The teachers involved in the study concurred that boys and girls now regard reading as a more exciting activity due to the introduction of high-interest reading materials, concrete (hands-on) reading activities, and a greater societal emphasis on the importance of acquiring reading skills in the past 10 years. Many of the teachers felt that research conducted 10 to 20 years ago in reading achievement should be replicated to determine if the changes they believed they had seen had actually occurred.

While this may be a major implication, two limitations of the study should be noted:

1. One of the major instruments used in the study, the Downing Object-Activity Opinion Survey, had not been previously validated

possibly affecting the results. From the current study three estimates of reliability - internal consistency, equivalent form, and test-retest - were obtained. The results indicated a poor to minimally acceptable reliability and thus the necessity of cautiously interpreting and generalizing from the findings of the study. (See the appendix for further information concerning reliability.)

2. The study was conducted with parochial school students. The two schools were selected on the basis of their abiltiy to make available to the researchers student IQ and reading achievement scores. There is the possibility that the subjects for this study belonged to a different population than nonparochial school students. It may be that parochial school students have different reading achievement records, reading attitudes, and reading perceptions than nonparochial school students. In addition, parochial school students may be part of a specially selected group where parents more concerned with educational attainments and achievement choose to place their children in nonpublic schools. These parents may be more supportive of school and reading programs than the parents of nonparochial school students. However, the small sample of two schools does not permit generalizing to all parochial schools.

In spite of the two limiations, it was felt that the study pointed out a need to review the results of prior research and to re-ask the questions asked in those studies. If trends have developed during the past decade, they sould be noted and studied. Educators, parents, and society, in general, should be informed of new findings and trends. Some of the questions which should be posed include:

1. Are there still significant sex differences in reading achievement in the United States?

2. Is reading still classified by a majority of people, children and adults, males and females, as a feminine activity?

3. Does the majority of boys at all grade levels, except first, still regard reading as a feminine activity?

4. Is there a trend in the change of boys' perceptions of reading in the elementary grades?

5. Do parochial school students differ from nonparochial school students in reading achievement, reading attitudes, and sex-typed perceptions of reading?

6. If there is a difference between parochial and nonparochial school students' reading achievement performances, what are some of the factors influencing the difference?

Additional research should be conducted to answer some of the preceding questions. Samples of students, both parochial and non-parochial, in different geographic areas of the United States, should be tested to determine if (a) sex differences in reading achievement occur in all the samples and (b) if reading is sex-typed by the majority of students as a feminine activity. It is recommended that this study be replicated with a larger sample of parochial school students to determine if similar results occur.

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APPENDIX

RELIABILITY FIGURES FOR THE DOWNING OBJECT-ACTIVITY OPINION SURVEY

The prototype of the Object-Activity Opinion Survey was developed by Downing and Thomson in 1977. The original form was a picture test designed to determine subjects' sex-role stereotypes of reading. The development of the instrument resulted from an interest in sex differences in reading achievement and the relationship between boys' and girls' perceptions of the sex-appropriateness of the reading activity and their reading performance.

The original instrument consisted of twelve drawings, including two practice items, of neuter "stick" figures engaged in activities suitable for a six-year old child. The subjects were asked to indicate who - a boy or a girl - was involved in the activity. One of the ten test items featured a "stick" figure reading a book. The other nine items served as distractors.

Following their 1977 study, Downing and Thomson revised the test to include 24 items (four practice items) in two booklets: a booklet of objects (kite, book, ball, etc.) and a booklet of the same objects shown with "stick" figures. The reading items were increased from one to two per booklet. The subjects were to indicate who should have the objects and who was engaged in the activities.

The revised form was used in a study by Gross (1978). She studied the relationship between sex-typed perceptions of reading and reading achievement with Israeli kibbutz children. The Survey was used to measure children's sex-typed perceptions of reading.

Downing and Thomson used the revised form of the Survey in subsequent research (Downing et al, 1979). Their study, conducted

in seven countries, examined patterns of sex-role stereotyping of the reading activity by males and females in student and adult samples.

The Survey was also used in a study of elementary students' sex-typed perceptions of reading and reading achievement by Steiner (1981). The instrument was used to measure students' perceptions of reading activity as feminine, masculine, sex-appropriate, and sex-inappropriate. The results of Steiner's study, inconsistent with other studies, prompted the recommendation that further studies be conducted to determine current trends in sex differences in reading achievement and the sex-typing of reading. However, it was felt that before subsequent research be conducted using the Object-Activity Opinion Survey, more information concerning the reliabiltiy and validity of the instrument should be obtained and utilized.

Three methods for measuring reliability were used: 1) internal consistency, 2) equivalent form, and 3) test-retest. An estimate for the first measure was computed using Cronbach's Alpha, the general case of KR-20. Multiple linear regression was used for the other two measures.

To obtain an estimate of internal consistency, the twenty test items on the Survey (excluding the four practice items) were subdivided into four scales of five consecutive items (1-5, 6-10, 11-15, 16-20) starting with the items in the Object booklet. The correlation coefficients for the individual items compared to the total scale and to the sub-scales ranged from .0661 to .5706, mostly within a low range. The coefficients and the alpha value of .4161 indicated a low internal consistency.

For the equivalent form measure, the items in the Object booklet were correlated with those in the Activity booklet. An aggregate r value was computed to correlate the two reading items in the Object booklet with the two in the Activity booklet. The results showed mostly low correlations (from .1601 to .5250 with .2248 for the reading items) between the individual items in the two booklets with a higher correlation of .7299 between the two booklets. The results suggested that while the two booklets are measuring essentially the same thing, it is not known what specifically is being measured. The low correlations between the individual items in the two booklets may be partially due to the form of the Activity booklet where "stick" figures are included with the objects. The subjects, instead of responding to the objects in the pictures, may have responded to the "stick" figures such that a given item may have received a specific response because the "stick" figure resembled one sex more than the other. Two different positions were used for the two reading items in the Activity booklet - a "stick" figure reclining and reading and one sitting in a chair reading. Again, the responses to the two items could have been influenced more by the "stick" figures than by the actual objects (books).

The test-retest measure resulted in a minimally acceptable reliability coefficient of .64 for group prediction and lower figures for individual prediction. The results indicated that one could make a fairly accurate prediction of a given group's responses on the second administration of the Survey while a far less accurate prediction of the responses of a specific individual within the group.